

REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For currently amended claims, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the remarks below.

Regarding the rejection of claims 4 and 6 under 35 USC 112, second paragraph, as being indefinite for reciting the limitation "the strip" in line 1 as having insufficient antecedent basis, Applicants respectfully submit that claims 4 and 6 are related to the thickness of the strip used to make both the flexible corrugated strip and the flat flexible strip of a thermal conductive material which is bonded to one side of the corrugated strip to form a single-face flexible corrugated strip article. If the objection is maintained any suggestions the Examiner has to amend the claims would be welcome.

Claims 1, 3, 16 and 24 have been rejected under 35 USC 102(b) as being anticipated by Haulshalter (Fig. 1) U.S. Patent No. 4,926,935.

The Examiner has also rejected claims 4 and 6 under 35 USC 103(a) as being unpatentable over Haulshalter in view of Takahashi U.S. Patent No. 5, 528,456.

The Examiner contends that Haulshalter discloses all the claimed limitations except the thickness of the corrugated strip. Takahashi is cited to disclose a heat sink (Fig. 4B) comprising a corrugated strip 9 of aluminum or copper having a thickness of 20-100 micrometers (0.8-3.9 mil) for the purpose of achieving a desired heat exchange. The Examiner concludes it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Haulshalter a thickness of 20-100 micrometers for the purpose of achieving a desired heat exchange as recognized by Takahashi.

The Examiner notes that the anticipatory rejection in view of Smith, Takahashi and Smith-Johannsen have been withdrawn.

The Examiner further notes that Applicants' remarks with respect to Haulshalter are partially correct. The Examiner notes and agrees that the object of Fig. 2 of Haulshalter was to eliminate the base plate to minimize weight and thermal resistance. However, the Examiner argues that the grounds of rejection is based on Fig. 1 of Haulshalter and, in this respect, Fig. 1 represents the prior art in which a corrugated fin composed of aluminum or copper is employed in combination with a base plate. The Examiner also contends that the fin and base plate are adhered to an electrical component via a bonding process.

It is respectfully submitted that the claims are properly allowable over Haulshalter and Takahashi whether taken singly or in any proper combination thereof.

Applicants understand that the grounds of rejection is based on Fig. 1 of Haulshalter which represents the prior art in which a corrugated fin composed of aluminum or copper is employed in combination with a base plate. The fin and base plate are then adhered to a component via a bonding process. It is respectfully submitted however that this is different and distinct from Applicants' invention which, as can be seen from the claims, is directed to a single-faced **flexible** corrugated strip article. The article used comprises a **flexible** corrugated strip of a thermal conductor material having a flat **flexible** strip of a thermal conductor material bonded to one side thereof. It is respectfully submitted that Applicants' article therefore is a single-faced **flexible** corrugated strip article and not the article shown in Haulshalter which shows a corrugated length of fin, and, as the Examiner contends, would anticipate Applicants' invention because it could have a base plate bonded thereto.

A base plate as used in Haulshalter is respectfully submitted to not be a flexible strip of a thermal conductor material which is bonded to a flexible corrugated strip as claimed by Applicants. In fact, in claim 4, the thickness of the strip used to make the corrugated strip and the flat flexible strip bonded thereto are both about 0.5 mil to 10 mil. This is not a base plate as used in Haulshalter and it is respectfully submitted that the flat flexible strip of Applicants is not the Haulshalter corrugated fin with a base plate.

It is clear that Haulshalter does not disclose any specific sized base plate that is used in combination with the corrugated fin as shown in Fig. 1. The dictionary definition of a plate based on the common use of the word is a smooth, flat, thin piece of material. In U.S. Patent No. 5, 625,229 to Kojima et al. (a patent of record), a heat sink fin assembly of the corrugated type for cooling an LSI package is shown comprising a flat base plate and a heat dissipating member made of a thin metal sheet having convex and concave portions. The purpose of Kojima et al. is to provide a heat sink fin assembly which is light-weight and which can be mass produced.

Kojima et al. also teach that the base plate should have a thickness to avoid deformation so that each fin structure has rigidity. See column 4, starting at line 6 to line 22. For example, as stated by Kojima et al. at lines 20-22, "In addition, in order to avoid deformation of the base plate 15b, the thickness "T" thereof must be 1.5 mm or larger". Further, in all the examples, the base plate has a thickness of at least 1.0 mm and typically 1.5 mm. Referring to Fig. 12C and the specification at column 8, the paragraph beginning at line 15, it is noted that it is difficult to bend the fin in a direction shown by arrow M and that the rigidity of the heat sink fin assembly 100 is increased. Rigidity again is an important feature of Kojima et al. and is correlated to the thickness of the base plate.

A base plate thickness of 1.0 mm is about 40 mil and for 1.5 mm is about 60 mil. A rigid structure as defined in any dictionary is a material which is deficient in

or devoid of flexibility. Flexibility is defined as a material which is pliant. Applicants are claiming a method to enhance the least dissipation of an integrated circuit device comprising as one of the steps the use of a single-faced **flexible** corrugated strip article. It is respectfully submitted that Applicants' flexible corrugated strip article is not the rigid article shown in Kojima et al. or in the primary reference to Haulshalter, which also uses a base plate as exemplified by Kojima et al.

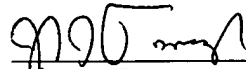
It is believed that the difference between Applicants' claimed invention and the prior art as shown in Haulshalter is a matter of semantics and Applicants respectfully submit that Applicants would be willing, if necessary, to amend the claim accordingly to further highlight the difference between Applicants' claimed single-faced **flexible** corrugated strip article and the corrugated article of Haulshalter having a base plate attached thereto; which article is rigid. Any suggestions of the Examiner would be welcome.

With regard to claims 4 and 6 which are rejected over Haulshalter in view of Takahashi, it is clear that Takahashi does not disclose a single-faced flexible corrugated strip article as claimed by Applicants. Takahashi merely shows that one component of Applicants' invention, the flexible corrugated strip, and that the strip may have a thickness of approximately 20-100 micrometers (0.8-3.9 mil). There is no disclosure in Takahashi of a flat flexible strip of a thermal conductor material bonded to one side of a flexible corrugated strip to form Applicants' single-face flexible corrugated strip article. Haulshalter uses a base plate of the prior art which

would be rigid as shown in the Kojima et al. patent of record. Accordingly, it is respectfully submitted that Takahashi does not supply the deficiencies of Haulshalter and that claims 4 and 6 are properly allowable under 35 USC 103(a).

It is respectfully submitted that the application has now been brought into a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited. Should the Examiner not find the claims to be allowable, Applicants' attorney respectfully requests that the Examiner call the undersigned to clarify any issue and/or to place the case in condition for allowance.

Respectfully submitted,


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date indicated below as first class mail in an envelope addressed to the Commissioner of Patents, Mail Stop AF, P.O. Box 1450, Alexandria, VA 22313-1450.

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